Correlative Environment Measurements

Topics Discussed

- **Model requirements**
  - Needed from LWS Science Missions & Targeted Research & Technology Program
- **Data needed for models**
- **Focus in on SET-2 needs**

Desired Data - Protons

- **Protons**
  - Spectral resolution
    - **Energy**
    - **Pitch angle**
  - Energy range
    - **< 100 keV: thin materials**
    - **100 kev to 1 MeV: thick materials and photovoltaics**
    - **100's of MeV: microelectronics, sensors**
  - Biggest shortcomings
    - **< 100 keV (materials)**
    - **> 100 MeV (microelectronics & sensors)**
    - **Lack of data in MEO**

Desired Data - Electrons

- **Electrons**
  - Spectral resolution (energy, pitch angle)
  - MEO, still some shortcomings and interest in GEO
  - Thermal plasma (<50 eV)
    - **For charging, high power antennas**
  - 50 eV to 50 keV
    - **For thin materials & charging**
  - .05 to 20 MeV
    - **Total ionizing dose, internal charging**
  - 1 to 100 MeV
    - **For internal charging**

Desired Data - Solar Particles

- **Solar Particles**
  - Protons
    - **> 100 MeV most important due to limited event statistics**
  - Heavy Ions
    - **LET Spectra – (0.1-100 MeV-cm2/mg)**
    - **GEO, MEO, Interplanetary, LEO Polar**

Desired Data for GEANT Validation

- **Validation of GEANT - Detector Description and Simulation Tool**
  - GEANT describes the passage of elementary particles through the matter.
    - **It was originally designed for the High Energy Physics experiments, it has today found applications also outside this domain in the areas of medical and biological sciences, radioprotection and astronautics**
  - The principal applications of GEANT in High Energy Physics are:
    - **The tracking of particles through an experimental setup for simulation of detector response**
    - **The graphical representation of the setup and of the particle trajectories.**
  - Measurement needs: Environment measurement in interior, i.e., on card, coordinated with microelectronics measurements as well as same environment monitor on exterior

Concluding Remarks

- **Need input from other sessions**
  - Refine previous discussion
  - Adding other measurements
    - **Dosimeters**
    - **Displacement damage**
    - **UV radiation**
    - **Atomic oxygen**
- **Prioritize measurements for SET-2 NRA**